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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,941	11/05/2001	Ira Jeffery Bush	OPTI-0008	9187

24507 7590 06/27/2003

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EXAMINER	
TURNER, SAMUEL A	
ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 06/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/992,941	BUSH, IRA JEFFERY	
	Examiner	Art Unit	
	Samuel A. Turner	2877	

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Rejections Under 35 U.S.C. § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15-20 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 15 there is no antecedent basis for "said first fiber means".

Claim Rejections Under 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 10 , 11, 15, and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Venkatesh et al(5,633,712) in view of Gelikonov et al(5,867,268).

Venkatesh et al teach a fiber low coherence reflectometer autocorrelator comprising a low coherence source(12), fiber probe(14) with a focusing lens(27), and a bulk optical Michelson interferometer which acts as an autocorrelator. The

autocorrelator includes a beam-splitter(19), reference mirror(20), scanning mirror(21), and detector(22). An all fiber autocorrelator is not shown by Venkatesh.

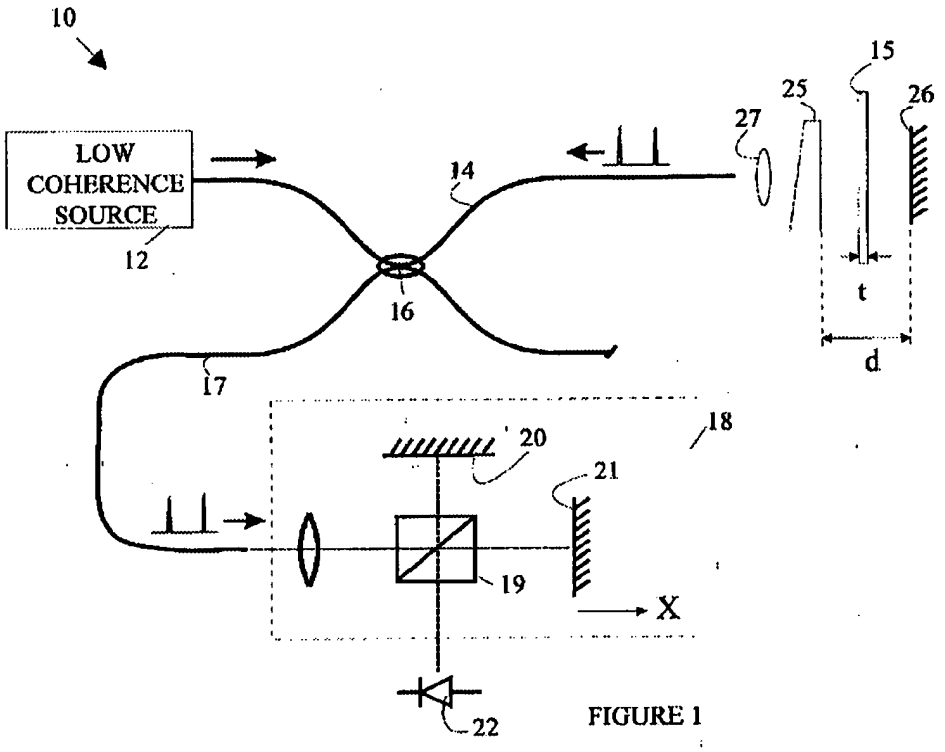


FIGURE 1

Gelikonov et al teach an all fiber low coherence interferometer comprising a low coherence source, first coupler(1), first fiber(4), probe(6), second fiber(5), reference mirror(8), and a detector. Piezoelectric modulator(7) is included to scan the optical path thus providing a practically inertialess path change. A second piezoelectric modulator(9) can be placed in the opposite arm of the interferometer connected in antiphase (a push/pull configuration) to further increase the total scan length.

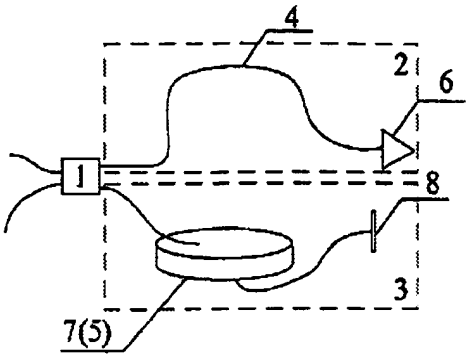


Fig. 1

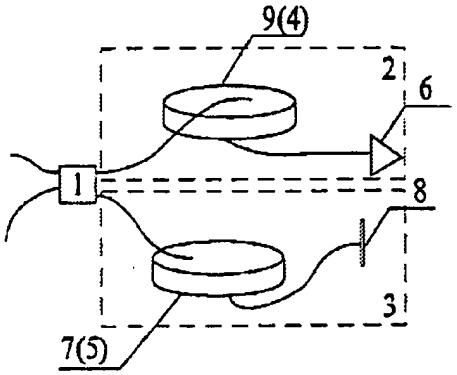


Fig. 2

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the bulk optical autocorrelator Michelson interferometer of Venkatesh with an all fiber Michelson interferometer so that the scanning mirror would be replaced with the fiber piezoelectric modulator scanner which provides for a practically inertialess path change.

With regard to claims 3 and 16; it would have been obvious to one of ordinary skill in the art to use single-mode fiber in an all fiber autocorrelator in order to reduce noise. Official notice is taken that single-mode is used in fiber sensors to reduce the number of modes thus substantially reducing the noise due to mode competition effects. Note the cost of single-mode fiber. See In re Malcolm, 1942 C.D 589; 543 O.G. 440.

Claims 6-9, 18, and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Venkatesh et al(5,633,712) and Gelikonov et al(5,867,268) as applied to claims 1-4, 10 , 11, 15, and 16 above, and further in view of Kempen et al(6,014,215).

Kempen et al teach a low coherence Michelson interferometer comprising a short coherence source(12), first fiber(22a), coupler(24), reference path(22b), scanning mirror(M_R), probe arm(22c), probe assembly(35), combined path(22d), and detector(16). Also included in the interferometer is long coherence source(112), coupler(122) for coupling the long coherence light to the Michelson interferometer, dispersive coupler(126) for separating out the long coherence light combined light path, and detector(116). The addition of the long coherence source and detector is to track the path change due to the scanning mirror.

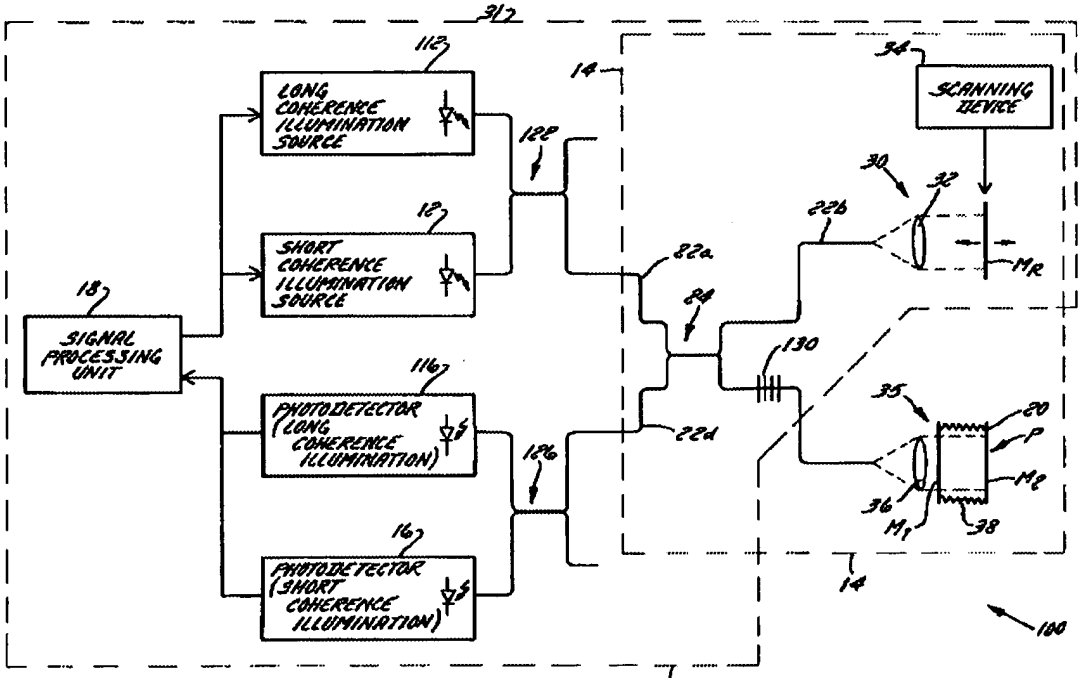


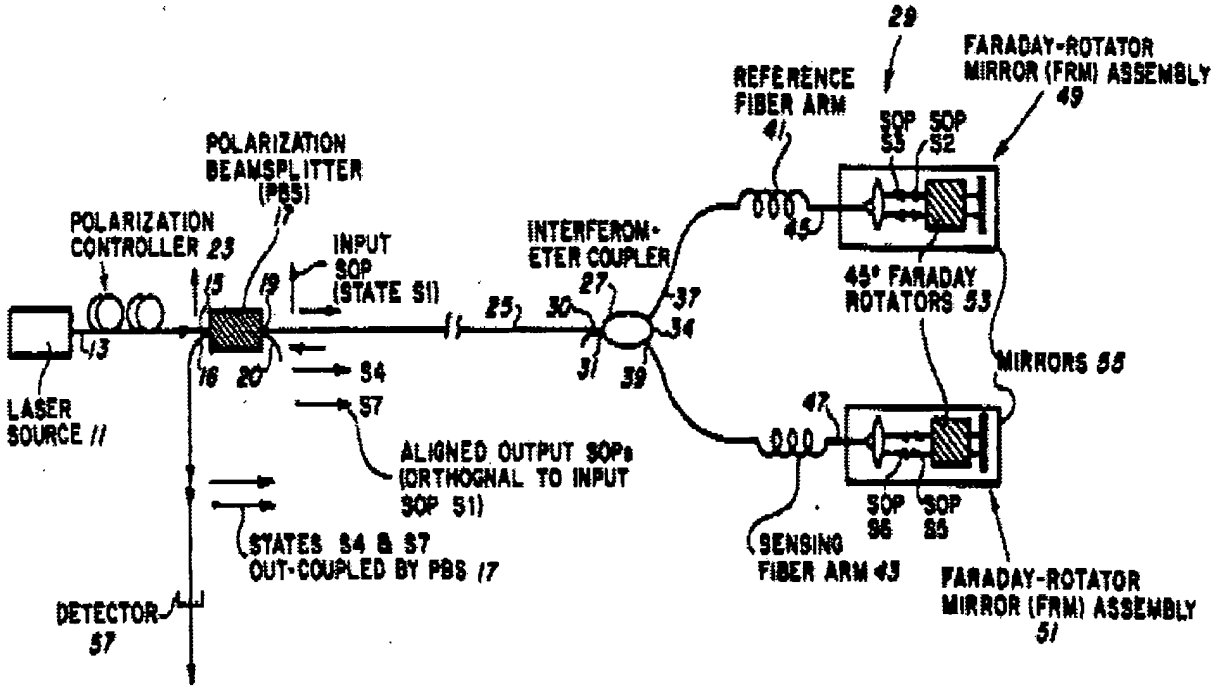
FIG. 6

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify an all fiber autocorrelator by including a separate

long coherence source and detector in order to monitor the scanned path length, as taught in Kempen.

Claims 5, 13, 14, and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Venkatesh et al(5,633,712) and Gelikonov et al(5,867,268) as applied to claims 1-4, 10 , 11, 15, and 16 above, and further in view of Kersey(5,206,924).

Kersey teaches the use of Faraday rotator mirrors(49,51) in a fiber optical Michelson interferometer in order to provide for passive elimination of polarization fading.



It would have been obvious to one of ordinary skill in the art at the time the

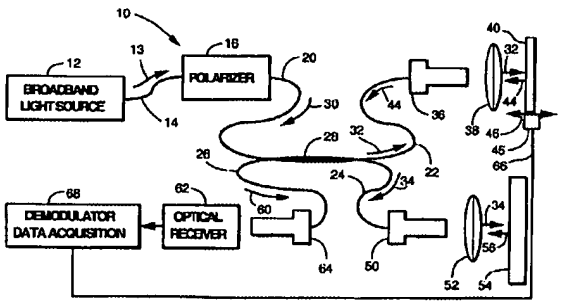
invention was made to replace the end mirrors in an all fiber autocorrelator arrangement with Faraday rotator mirrors in order to provide for passive elimination of polarization fading.

Claim 20 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Venkatesh et al(5,633,712), Gelikonov et al(5,867,268), and Kersey(5,206,924) as applied to claims 1-5, 10 , 11, and 13-17 above, and further in view of Kempen et al(6,014,215).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify an all fiber autocorrelator by including a separate long coherence source and detector in order to monitor the scanned path length, as taught in Kempen.

Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Venkatesh et al(5,633,712) and Gelikonov et al(5,867,268) as applied to claims 1-4, 10 , 11, 15, and 16 above, and further in view of the prior art of applicant's figure 1.

Applicant's prior art figure 1 teaches a Michelson fiber interferometer which includes an input polarizer and polarization maintaining fiber to limit the polarization a single polarization mode thus eliminating polarization fading.



PRIOR ART *FIGURE 1*

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a polarizer in an all fiber autocorrelator and to use polarization maintaining fiber in the all fiber autocorrelator in order to eliminate polarization fading.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner those telephone number is **(703) 308-4803**. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font, can be reached on (703) 308-4881.

The fax phone number for this Group is (703) 308-7722. The faxing of papers related to this application must conform with the notice published in the Official Gazette, 1096 O.G. 30 (15 November 1989). The Group receptionist telephone number is (703) 308-0956.

Any inquiry of a technical nature regarding reissues, petitions, and terminal disclaimers should be directed to Ed Glick whose telephone number is (703) 308-4858, Hien Phan whose telephone number is (703) 308-7502, or Ed Westin whose telephone number is (703) 308-4823.

Any other inquiry of a technical nature, and all inquiries of a general nature including those relating to the status of this application or any patent term adjustment should be directed to TC2800 Customer Service Office whose telephone number is (703) 306-3329.

Samuel A. Turner
Primary Examiner
Art Unit 2877

SAT
June 24, 2003